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Differential Amplifier Drives DC-Coupled, Ground-Referenced 100MHz Signals with Low Noise & Low Distortion

MILPITAS, CA – October 12, 2010 – Linear Technology introduces the [LTC6409](#), a fully differential amplifier capable of driving DC to 100MHz signals with just 1.1nV/ $\sqrt{\text{Hz}}$ noise and -88dBc HD2/HD3 distortion. Built on an advanced SiGe BiCMOS process, the LTC6409 features 10GHz gain-bandwidth product, 100dB SFDR up to 40MHz, and 1% settling time of 1.9ns. It is ideal for driving the latest high speed ADCs such as the 1.8V 14-bit 150Mps LTC2262-14. The LTC6409 features wide input common mode range of 0V to 3.5V and output common mode range of 0.5V to 3.5V when using a single 5V supply, making it easy to interface ground-referenced signals to differential pipeline ADCs.

Gain and feedback resistors are external, allowing the designer to configure the exact gain needed for each application. The amplifier is unity gain stable and high output current of up to 95mA allows it to drive lower value feedback and gain resistors, such as 150Ohm, resulting in very low output noise.

The LTC6409 is fully specified to operate with either a 3V or 5V single supply. Despite its wide bandwidth and low noise performance, supply current power consumption is just 56mA max and a shutdown mode reduces this to 500uA when turned off. Turn-on time is typically 160ns.

The LTC6409 will find use in pulsed signal applications such as radar signal processing, imaging, high speed test and measurement and communications applications.

“The flexibility and performance of the LTC6409 make it a great choice for DC-coupled time domain sensor applications as well as direct conversion receiver applications,” says Kris Lokere, design manager at Linear Technology. “It easily translates voltage levels and converts single-ended signals to differential, while maintaining very low noise and distortion.”

The LTC6409 is available in a 2mm x 3mm QFN package, fully specified over the C- (0°C to 70°C), I- (-40°C to 85°C) and H- (-40°C to 125°C) temperature grade ranges. Prices start at \$4.50 each in 1,000 piece quantities. For more information, visit www.linear.com/6409.


Photo Caption: 1.1nV/ $\sqrt{\text{Hz}}$, 88dB SFDR from DC to 100MHz Differential Amplifier

Summary of Features: LTC6409

- 10GHz Gain-Bandwidth Product
- 88dB SFDR at 100MHz, 2VP-P
- 1.1nV/ $\sqrt{\text{Hz}}$ Input Noise Density
- Input Range Includes Ground
- External Resistors Set Gain (Min 1V/V)
- 3300V/ μs Differential Slew Rate
- 52mA Supply Current
- 2.7V to 5.25V Supply Voltage Range
- Fully Differential Input and Output
- 0.5V to $V_{\text{S}}-1.5\text{V}$ Adjustable Output Common Mode Voltage
- Low Power Shutdown
- Small 10-Lead 3mm \times 2mm \times 0.75mm QFN Package

About Linear Technology

Linear Technology Corporation, a manufacturer of high performance linear integrated circuits, was founded in 1981, became a public company in 1986 and joined the S&P 500 index of major public companies in 2000. Linear Technology products include high performance amplifiers, comparators, voltage references, monolithic filters, linear regulators, DC-DC converters, battery chargers, data converters, communications interface circuits, RF signal conditioning circuits, uModule[®] products, and many other analog functions. Applications for Linear Technology's high performance circuits include telecommunications, cellular telephones, networking products such as optical switches, notebook and desktop computers, computer peripherals, video/multimedia, industrial instrumentation, security monitoring devices, high-end consumer products such as digital cameras and MP3 players, complex medical devices, automotive electronics, factory automation, process control, and military and space systems.

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